ABSTRACT

A micro-electromechanical valve assembly includes an elongate actuator that is anchored at one end to the wafer substrate to be in electrical contact with the drive circuitry layers. A closure member is mounted on an opposite end of the elongate actuator. The actuator is configured to receive an electrical signal from the drive circuitry layer to displace the closure member between a closed position in which the closure member covers the fluid supply opening and ink is inhibited from flowing through the fluid supply channel and an open position. The elongate actuator is shaped so that, in a rest condition, the actuator encloses an arc. The actuator includes a heating portion that is capable of being heated on receipt of the electrical signal to expand. The heating portion is configured so that, when the portion is heated, the resultant expansion of the portion causes the actuator to straighten at least partially and a subsequent cooling of the portion causes the actuator to return to its rest condition thereby displacing the closure between the closed and open positions.